

## Re: Another question about derivatives

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*Source:* <http://sci.tech-archive.net/Archive/sci.math/2005-12/msg04727.html>

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- *From:* quasi <quasi@xxxxxxxx>
  - *Date:* Mon, 26 Dec 2005 21:25:36 -0500
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On 26 Dec 2005 18:05:14 -0800, "Dave L. Renfro" <renfr1dl@xxxxxxxx> wrote:

>The World Wide Wade wrote:

>

>>> I see we're having a little too much eggnog  
>>> during the holidays.  $[f(x)-f(0)]/(x-0) = f'(c_x)$ ,  
>>> right? So if  $f'(c_x) \rightarrow 0$ , then ...

>

>quasi wrote:

>

>> then  $\lim f'(x) \rightarrow 0$  as  $x \rightarrow 0$ .

>>

>> What am I missing?

>

>Well, actually you don't know that  $f'(x) \rightarrow 0$  as  $x \rightarrow 0$   
>simply from  $f'(c_x) \rightarrow 0$  (the stronger limit, where  $x \rightarrow 0$ ,  
>might not exist, while the weaker limit, where  $x$  approaches  
>zero in such a way that  $x$  is always equal to one of the  $c_x$ 's,  
>might exist), although of course we do know that  $f'(x) \rightarrow 0$   
>because this was in the original poster's hypothesis. [I'm not  
>suggesting that you didn't recognize this as in the original  
>hypothesis, by the way. Indeed, I assume this was part of  
>your confusion, namely that the argument seems to only prove  
>something we already knew. My point is that the argument  
>doesn't even do this as far as I can tell.]

>

>I believe what's going on is that in the equation

>

>  $[f(x)-f(0)] / (x-0) = f'(c_x)$ ,

>

>if we take the limit as  $x \rightarrow 0$  of both sides, then the  
>left side becomes the definition of  $f'(0)$  and the right  
>side becomes 0.

>

>Dave L. Renfro

Thanks, Dave.

Re: Another question about derivatives

I did finally realize what I was missing.

quasi

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• **Follow-Ups:**

- ◆ **Re: Another question about derivatives**  
◇ From: Dave L. Renfro

• **References:**

- ◆ **Another question about derivatives**  
◇ From: Stephen J. Herschkorn
- ◆ **Re: Another question about derivatives**  
◇ From: The World Wide Wade
- ◆ **Re: Another question about derivatives**  
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◇ From: Dave L. Renfro

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